

Claims:

1 21. (new) An apparatus for transmitting a signal from deep in a wellbore
2 through a string of tubulars said apparatus comprising
3 a signal conductor and a tubular
4 said signal conductor located adjacent an interior surface of said
5 tubular,

6 a thin coating on the interior surface of the tubular, the thin
7 coating for smoothing said interior surface to improve the hydraulic and
8 hydrodynamic properties of the tubular, said thin coating of a sufficiently small
9 thickness that hydrodynamic or pressure carrying properties of the tubular are
10 not adversely affected, and

11 said signal conductor beneath said thin coating.

12 22. (new) The apparatus of claim 21 wherein said thin coating is between
13 0.127 mm and 2 mm thick.

14 23. (new) The apparatus of claim 21 wherein the signal conductor is at least
15 one wire.

16 24. (new) The apparatus of claim 23 wherein the wire has a diameter between
17 0.127 mm to 0.0787 mm.

18 25. (new) The apparatus of claim 21 wherein said signal conductor is foil.

19 26. (new) The apparatus of claim 21 wherein said signal conductor comprises
20 a micro strip line, the micro strip line comprising a conductive core and an insulating
21 layer.

22 27. (new) The apparatus of claim 26 wherein the conductive core is between
23 0.048 mm and 0.05 mm thick.

24 28. (new) The apparatus of claim 27 wherein the micro strip line has a
25 thickness of at least 0.65 mm and not more than 1 mm.

26 29. (new) The apparatus of claim 21 wherein said signal conductor extends
27 substantially the entire length of said tubular.

28 30. (new) The apparatus of claim 21 further comprising a plurality of signal
29 conductors including a first signal conductor and a second signal conductor, the first
30 signal conductor carrying a signal and the second signal conductor carrying

substantially the same signal.

31. (new) The apparatus of claim 21 wherein said signal conductor is provided with means for transferring said signal from said signal conductor to another signal conductor in an adjacent tubular.

32. (new) The apparatus of claim 21 wherein said signal conductor is provided with an antenna at at least one end of said tubular.

33. (new) The apparatus of claim 21 wherein a receiving antenna is provided at one end of said tubular and a transmitting antenna is provided at the other end of said tubular, said signal conductor arranged therebetween.

34. (new) The apparatus of claim 21 further comprising an amplifier-repeater, said amplifier-repeater comprising a signal amplifier and a power source.

35. (new) The apparatus of claim 21 wherein said tubular has a wall recess in the interior surface and said signal conductor is arranged in said recess.

36. (new) The apparatus of claim 21 wherein said tubular is drill pipe.

37. (new) The apparatus of claim 21 wherein the tubular has two spaced-apart ends, the apparatus further comprising
a ring transmitter-receiver amplifier-repeater at each end of the tubular.

38. (new) The apparatus of claim 37 wherein each ring is not connected to the signal conductor.

39. (new) The apparatus of claim 38 wherein

the signal conductor comprises four wires embedded in the thin coating, each wire of the four wires having a portion at each end of the tubular, each of said portions forming a part of a circle, each wire insulated from the remaining wires.

40. (new) A method for transmitting a signal from deep in a wellbore through a string of tubulars, the method comprising passing said signal through an apparatus, the apparatus comprising

a signal conductor,

said signal conductor located adjacent an interior surface of a tubular in the string of tubulars,

7 a thin coating on the interior surface of the tubular, the thin
8 coating for smoothing said interior surface to improve the hydraulic and
9 hydrodynamic properties of the tubular, said thin coating of a sufficiently small
10 thickness that hydrodynamic or pressure carrying properties of the tubular are
11 not adversely affected, and

12 said signal conductor beneath said thin coating.